

## **Evaluation of a Traveling Hydrolox Screen in the Secondary Channel at the Tracy Fish Collection Facility**

### **Investigators**

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### **Summary**

The existing louver systems at the Tracy Fish Collection Facility (TFCF) are not as efficient as originally designed because of changing aquatic debris conditions (Boutwell and Sisneros 2007). Increased aquatic vegetation impacts the hydraulic performance of the louver-bypass system and holding tank conditions. The louvers require daily cleaning which is an elaborate process. In the primary channel, individual louver panels must be raised for cleaning which creates a 2.4-m (8-ft) gap in the louver wall. This potentially allows for downstream fish losses and upstream movements by predatory fish. In the secondary channel, the louvers are cleaned by draining the channel which causes a periodic shut down of the fish bypass system. This creates greater opportunity for predation in the bypass pipes and loss of small fish through the primary louvers. The existing vertical traveling screen is moderately efficient at removing entrained aquatic debris (Boutwell and Sisneros 2007) and is rarely used because of logistic problems.

A Hydrolox traveling screen is currently being designed to replace the secondary louvers. This type of screen should improve debris removal while minimizing fish injury or loss during operation and cleaning. If successful, this type of screen may replace the louvers in the primary channel. A stationary Hydrolox traveling screen was tested in the secondary channel in FY 2009. These pilot tests found that 70–80% of released debris was captured by the screen when pegs were attached perpendicular to the screen face (B. Mefford 2009, personal communication). Screen design will be completed in FY 2010 with installation anticipated for FY 2011 (B. Mefford 2009, personal communication).

### **Problem Statement**

Aquatic debris loads at the TFCF have increased since the 1950s when the louver-bypass system was designed. This debris impacts facility operations and potentially

salvage efficiency (J. Imai 2009, personal communication). The secondary channel at the TFCF will be used to test the performance of a Hydrolox traveling screen at removing debris and diverting fish into the bypass system.

## Goals and Hypotheses

### *Goals:*

1. Review existing fish salvage information for the louver system.
2. Review existing information for debris loads and removal for the louver system.
3. Compile hydraulic data for the secondary channel louver system.

### *Hypotheses:*

None until final screen design is completed.

## Materials and Methods

We will compare facility efficiency between the louver system and Hydrolox/primary louver system. Design of the Hydrolox screen is ongoing and expected to continue in FY 2010. Installation of the screen may occur in FY 2010 but more likely FY11 (B. Mefford 2009, personal communication). In FY 2010, we will write a proposal to investigate fish salvage efficiency, assess fish injury, debris removal efficiency, and hydraulic properties of the Hydrolox screen for implementation in FY 2011.

## Coordination and Collaboration

These studies will be coordinated with the California Department of Fish and Game's Delta diversion facilities reporting program, and the TFCF staff.

## Endangered Species Concerns

Incidental "take" of ESA listed salmon, steelhead, and delta smelt is possible and such fish will be returned to Delta waters as quickly as possible. The total number of each ESA species incidentally caught or collected during the experiment will be recorded and sent to the reporting agencies. The incidental take from this research is covered under the TFCF Section 10 permit.

## Dissemination of Results (Deliverables and Outcomes)

We will provide an update on screen design and installation, and review of existing related information to the Tracy Technical Advisory Team in FY 2010.

## Literature Cited

Boutwell, J.E. and D. Sisneros. 2007. *Water born debris removal evaluations using a traveling screen at the Tracy Fish Collection Facility, Tracy, California*. Tracy Fish Facility Studies, Volume 33. Bureau of Reclamation, Mid-Pacific Region and Denver Technical Service Center.

Imai, J. 2009. Tracy Fish Collection Facility, Bureau of Reclamation, Tracy, California, personal communication.

Mefford, B. 2009. Hydraulic Investigations and Laboratory Services Group, Bureau of Reclamation, Denver, Colorado, personal communication.